

World class performance in  
drinking, raw and wastewater  
reticulation systems.



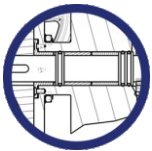
***VOSA BUTTERFLY VALVE***



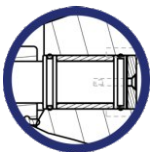
VOSA double eccentric butterfly valves are designed for installation in water supply systems to enable isolation of water lines and come standard with flanged end connections. The standard valve incorporates a rubber seal ring that is retained on the valve disc (SEAL ON DISC design) and is manufactured using VOSA drinking water approved EPDM rubber and is offset to the disc shaft centreline – so the shaft does not pass through the seal.

The seal ring and seat are spherically arranged to enable compression adjustment by increasing the seal retainer ring force through tensioning each retainer ring screw individually. Both the seal ring and the seal retainer ring are replaceable. All valves are manufactured and designed in accordance with SANS 1849 and BS EN 593. The valves will be either fusion bonded epoxy coated or two pack coated internally and externally to ensure durability. The valves are suitable for bi-directional application with a preferred flow direction indicated on the body.

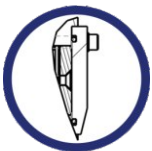
## Design Features and Advantages



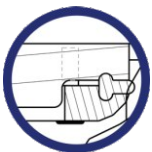
A triple “o-ring” design on the valve drive end shaft prevents any media from passing into the gearbox or to atmosphere.



A double “o-ring” design on the free end shaft prevents any media from passing into the free end area



A static “o-ring” on the end cover prevents the ingress of dust and dirt from entering the valve on the free end area.

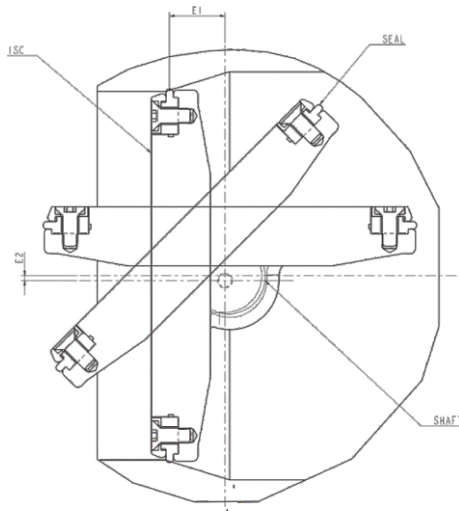


The valve utilises a seal on disc design with a replaceable EPDM seal ring and stainless steel retainer ring to ensure no nodular growth in the seating area as this is constantly in the fluid flow path. The seal retainer ring and the disc itself is manufactured from stainless steel corrosive resistant material. VOSA butterfly valves are supplied with a 304 stainless steel weld deposit seat for better corrosion resistance.



An adjustable set screw enables precise adjustment of the disc tilt. The support of this set screw is integrally casted to ensure no movement of the screw is possible through fluid flow or surges.

## Double Eccentricity Explained



- E1** The first eccentricity ensures the valve has an uninterrupted resilient seal.
- E2** The second eccentricity ensures the valve seal moves away from the seat in a “cam” like motion, thus ensuring less wear and low torque requirements..

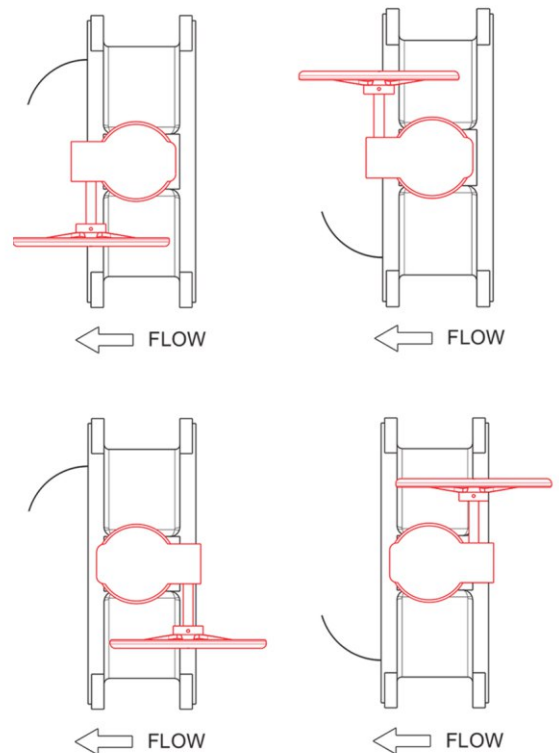
Normally butterfly valves are sold as **concentric, double or triple eccentric**.

**A concentric valve** is where the shaft and disc are centred to the seat and the body of the valve. It is normally used in lower pressure applications and is not often used for heavy duty applications.

**A double eccentric valve** is also known as a high performance butterfly valve. There is two offsets to the stem as explained with E1 and E2 above. These valves are available in higher pressure applications up to 40 bar (900 PSI) and is often used in power generation, pulp and paper, water reticulation networks and wastewater treatment plants. The double eccentric butterfly valve is the most commonly sold butterfly valve in our market sector.

**A triple eccentric butterfly valve** is similar to a double eccentric valve with the sealing geometry being different. It is generally metal seated and is similar in application to a wedge gate valve and is used in high pressure and temperature applications and are generally more expensive than the double eccentric valve.

## Gearbox Orientation



Note:

Minimum torque in table is the minimum required torque to crack the valve open under relevant pressures on the input shaft of the gearbox.

Maximum torque is the maximum available input torque of the gearbox. Gearbox Ratios available on request.

### Max operating torques on input shaft of gearbox

Size (mm)	PN10 (Nm)	PN16 (Nm)	PN25 (Nm)	PN40 (Nm)
DN80	5 - 29	10 - 29	15 - 29	22 - 29
DN100	8 - 83	17 - 83	26 - 83	47 - 83
DN150	12 - 83	25 - 83	37 - 83	65 - 83
DN200	16 - 152	34 - 152	55 - 152	96 - 152
DN250	24 - 152	45 - 152	65 - 152	110 - 152
DN300	36 - 171	56 - 171	85 - 171	145 - 171

## VOSA Butterfly Valve Engineering Data

### Cv, Kv and Pressure Drop Calculation

$$Q = C_v \cdot \sqrt{\frac{\Delta P}{SG}}$$

$$Q = K_v \cdot \sqrt{\frac{\Delta P}{SG}}$$

Q: Water flow rate (US gpm)  
 Cv: Valve flow co-efficient (US gpm)  
 ΔP: Pressure drop (psi)  
 SG: Specific Gravity of Water

Q: Water flow rate (m<sup>3</sup>/h)  
 Kv: Valve flow co-efficient (m<sup>3</sup>/h)  
 ΔP: Pressure drop (bar)  
 SG: Specific Gravity of Water

### Butterfly Valve Cv and Kv Values

Valve Size (inch)	Valve Size (mm)	Cv Value	Kv Value
3	80mm	473	409
4	100mm	736	637
6	150mm	1615	1397
8	200mm	2918	2524
10	250mm	4396	3803
12	300mm	6299	5448

The Kv value expresses the amount of flow (m<sup>3</sup>/h) through a valve that would result in a pressure drop of 1 bar across a fully open valve at a temperature of 15°C

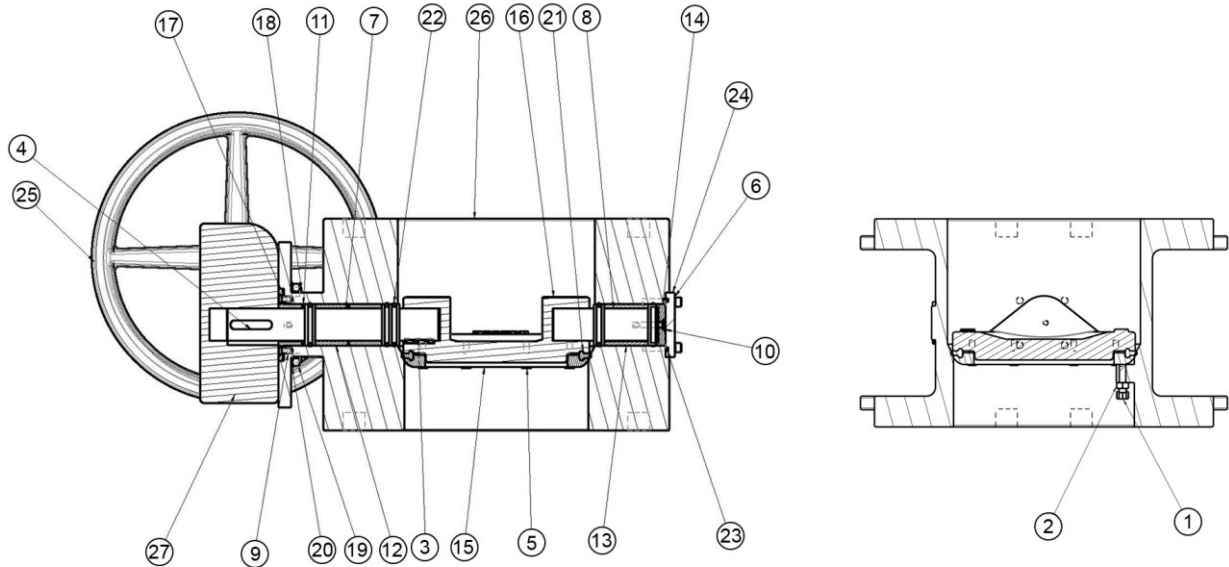
The Cv value expresses the amount of flow (usgpm) through a valve that would result in a pressure drop of 1 psi across a fully open valve at a temperature of 60°F

Note: Values as depicted above are purely theoretical and are in the process of being tested at the ESKOM Research and Innovation Centre Flow Laboratory.

The tests will be performed on the DN200 VOSA Butterfly valve and values for other valves will be theoretically interpreted from these test results.

The Laboratory is an ISO 17025 accredited facility and all instrumentation that will be used for the tests will be certified according to the South African National Accreditation System (SANAS).

## Sizes 80mm - 300mm



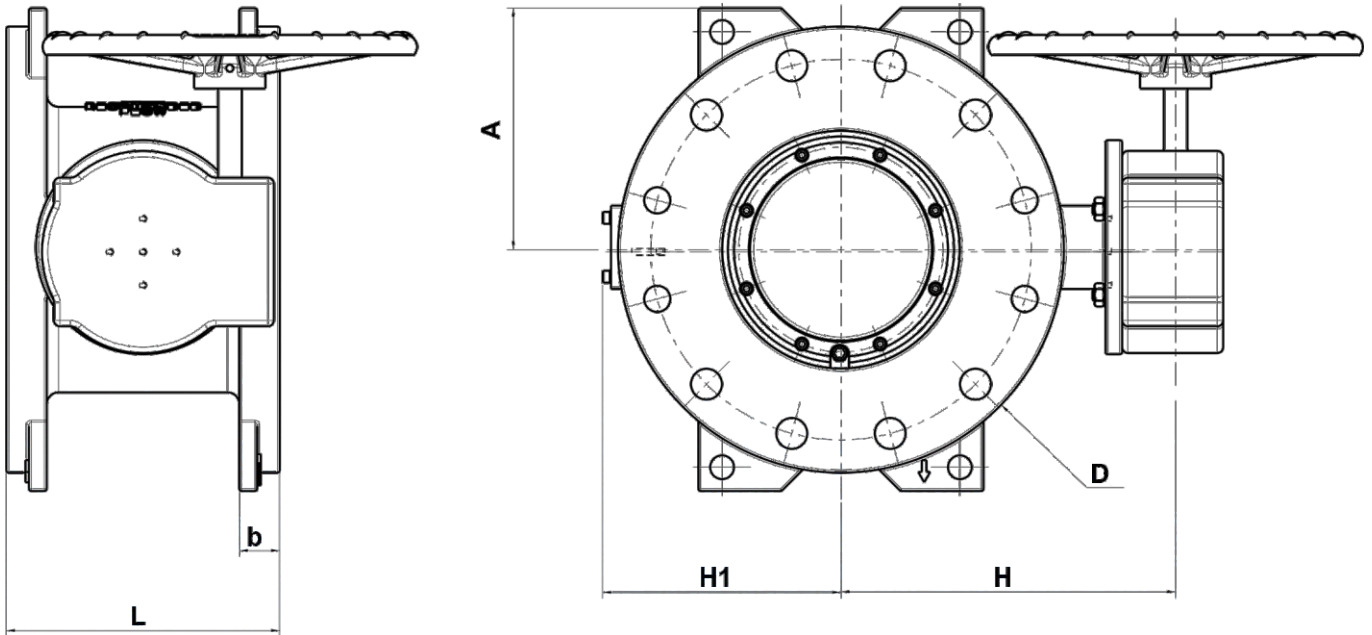
### Materials of Construction - PN10 & PN40

Item	Part Name	Material	Quantity
1	Adjustment Screw	Stainless Steel 304	1
2	Lock Nut	Stainless Steel 304	1
3	Drive Shaft Key	Stainless Steel 431	1
4	Gearbox Key	Stainless Steel 431	1
5	Cap Screw	Stainless Steel 316	12
6	Washer	Stainless Steel 316	12
7	Drive End Shaft	Stainless Steel 431	1
8	Free End Shaft	Stainless Steel 431	1
9	Countersink Bolt	Stainless Steel 304	4
10	Countersink Bolt	Stainless Steel 304	4
11	Thrust Washer	BS 1400 PB1C	1
12	Drive End Shaft	BS 1400 PB1C	2
13	Free End Bush	BS 1400 PB1C	1
14	Thrust Bearing	BS1400 PB1C (Cu, SM10, P)	1
15	Seal Retainer Ring	Stainless Steel 316	1
16	Disc	Stainless Steel 316	1
17	Bush Stopper	Stainless Steel 316	1
18	Running Studs	Stainless Steel 316	4
19	Nut	Stainless Steel 316	4
20	Washer	Stainless Steel 316	4
21	Seal Ring	EPDM Rubber	1
22	O-Ring	EPDM Rubber	5
23	O-Ring	EPDM Rubber	1
24	End Plate	S 355 JR	1
25	Handwheel	Ductile Iron SG42	1
26	Body	Ductile Iron SG42	1
27	Gearbox	To Manufacturers Spec	1

Components may be substituted with equivalent or higher class materials without notification.



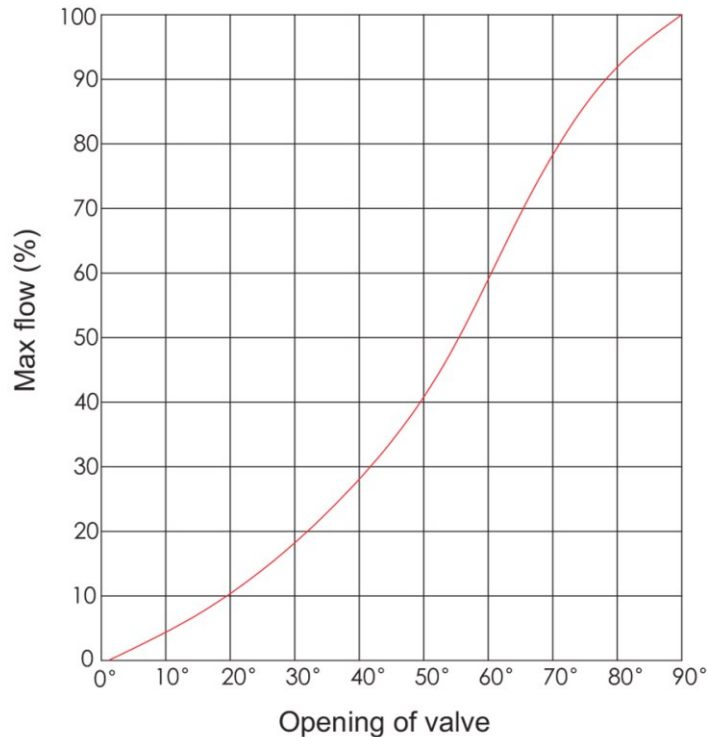
## Operating Torques



Size (mm)	D				b				A			
	PN10	PN16	PN25	PN25	PN10	PN16	PN25	PN25	PN10	PN16	PN25	PN25
DN80	200	200	200	200	19	19	19	19	110	110	110	110
DN100	220	220	235	235	19	19	19	19	117	117	128	128
DN150	285	285	300	300	19	19	20	26	145	145	160	160
DN200	340	340	360	375	20	20	22	30	168	168	188	203
DN250	395	405	425	450	22	22	24.5	34.5	119	209	229	254
DN300	445	460	485	515	24.5	24.5	27.5	39.5	209	224	249	279

Size (mm)	L				H1				H			
	PN10	PN16	PN25	PN40 Class 300	PN10	PN16	PN25	PN25	PN10	PN16	PN25	PN25
DN80	180	180	180	180	111	111	111	111	153	153	153	153
DN100	190	190	190	190	121	121	129	129	184	184	184	184
DN150	210	210	210	210	150	150	158	158	209	209	209	209
DN200	230	230	230	230	177.5	177.5	177.5	199	283	283	283	283
DN250	250	250	250	250	186	194	220	249	342	342	342	342
DN300	270	270	270	270	240	252	260	270	362	362	362	362

## Flow Rate vs Valve Opening



## How to specify VOSA Butterfly valves:

### Valve Range: DN 080-300, PN 10-40

- Design shall be a high performance, resilient seat, double eccentric butterfly valve in ductile cast iron with flanged end connections, face-to-face acc. to SANS 1849/BS EN 558-1.
- Seals shall be drinking water approved EPDM rubber.
- Internal bolts shall be grade A2-70.
- Disc shall close against a weld deposit stainless steel seat, seal shall be fixed to disc with a stainless steel retainer ring.
- Design shall incorporate an adjustable set screw that is integrally casted in the body.
- Thrust bearing and radial bushes shall be bronze.
- Shaft material shall be stainless steel 431.
- Coating shall be 250 µm fusion bonded epoxy or two pack epoxy coated, RAL 5015.
- Operation shall be by hand wheel via gearbox, with position indicator, clockwise to close as standard orientation.
- Maximum operating temperature shall be 70°C.

### Design shall be created and tested in accordance with following:

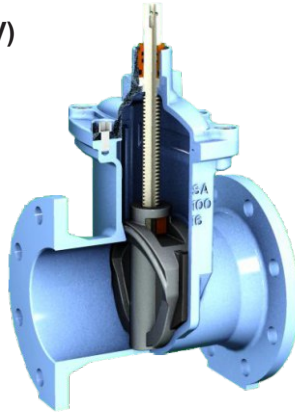
- SANS 1849 (butterfly valves for general purpose)
- BS EN 593 (industrial metallic butterfly valves)
- SANS 1849 and BS EN 558-1 (face-to-face)
- SANS 1123 (flanges)
- BS EN 12266 (leak test in production)

# World Class Performance Water Valves

## Vosa Resilient Seal Valve (RSV)

Robust resilient seal gate valves designed for water, slurry and sewage applications to SANS 664 specifications

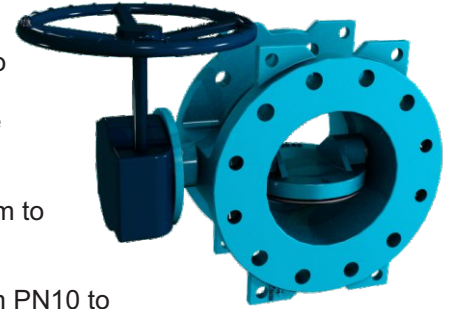
- Available in sizes from 50mm to 300mm
- All RSV's rated to PN16



## Vosa Butterfly Valve

High performance double eccentric butterfly valves to ensure less wear on seal and lower operating torque requirements.

- Available in sizes of 80mm to 300mm
- Pressure ratings vary from PN10 to PN40



## Vosa Wedge Gate Valve

Metal seated wedge gate valves for isolation and scouring purposes and used in water, mining, power, marine and general industries

- Available sizes from DN50 to DN1200
- Pressure range vary up to 64 bar depending on the size of the required valve



## VENT-O-MAT Air Valves

Considered the world leaders in air transfer technology in water, slurry, tailings and sewage pipelines with the first ever integral "anti shock" technology for surge protection.

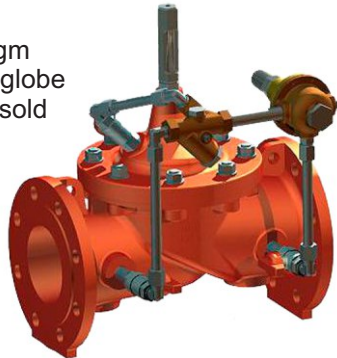
- RBX sizes 25mm to 200mm up to \*100 Bar
- RBXc sizes 25mm to 300mm up to 25 Bar Same as RBX but with FBE coated ductile iron bodies
- RGX sizes 50mm to 300mm up to 25 Bar
- RGXII sizes 50mm to 200mm up to 16 Bar
- RPS sizes 15mm to 50mm up to 16 Bar



## CLA-VAL Diaphragm Control Valve

Hydraulic operated, diaphragm actuated, single chambered globe pattern control valves. Most sold control valve in the world

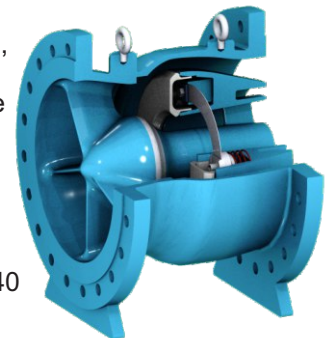
- 2500 hydraulic functions available
- Sizes ranging from 25mm to 1200mm
- Pressure range available up to 40 bar



## VENT-O-MAT Nozzle Check Valve

Characterized by "non-slam" closure, low pressure loss, metal to metal sealing and considered maintenance free.

- NCV-B (Long F/F) and NCV-BK (Short F/F) sizes DN200 - DN1200
- Pressure ratings from PN10 to PN40



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